

MANAGEMENT OF NON-COMMUNICABLE DISEASE PREVENTION AT DISTRICT LEVEL IN MALAYSIA

Diana. R.,¹ Safrin. M.,¹ Nada.¹ *Rosliza A. M.²

¹ Master in Public Health Candidate, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

² Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

*Corresponding author: Rosliza Abdul Manaf email: rosliza_abmanaf@upm.edu.my

<https://doi.org/10.32827/ijphcs.6.4.53>

ABSTRACT

Background: The Non –Communicable Disease (NCD) unit in Malaysia has had much focus in recent years as its country undergoes a major epidemiologic transition with the rise in the four largest contributors of NCD deaths namely cardiovascular disease, cancer, diabetes and chronic respiratory disease. In line with reducing the burden of NCD both for the patient and healthcare, the district health office plays a vital role in managing disease prevention through adequate planning, focusing on the implementation of primary, secondary and tertiary prevention and monitoring the health of the population.

Materials and Methods: A literature review was conducted through online database search such as Google Scholar and PubMed to identify articles that were related to the current management of non-communicable disease prevention. Initial keywords used were district health management, non-communicable disease, prevention and Malaysia. The reference list was also reviewed for related articles including some that were handpicked.

Result: Healthcare system in Malaysia is performed as a top down exercise whereby most of the national planning is conducted at federal level by the Ministry of Health. However, at the ground level, the district health office needs to conduct situational analysis to identify the needs and challenges of the local community within their jurisdiction. The management of NCD prevention is focusing on the implementation of actions through primary, secondary and tertiary prevention levels that fall within the role of health professionals and health care providers in primary care, hospitals and community services environment.

Conclusion: Community empowerment and health education are important components in primary prevention of NCD. Early diagnosis and prompt treatment for NCD provided at the district level will stop the progression of the disease, leading to a better prognosis. Tertiary prevention in the form of rehabilitation at district level reduces and limits the disability and impairment related to NCD.

Keywords: Non-communicable disease, prevention, district level, NCD program, community empowerment

1.0 Introduction

1.1 District Health Services

The World Health Organization (WHO) has over time acknowledged the district as the most practical unit to achieve universal health coverage while implementing the many international health policies (Fusheini & Eyles, 2016). Malaysia has a very structured and hierarchical system whereby the district health office plays the role of being the basic operational level in the healthcare system after the federal and state health departments through decentralization of its healthcare (Monekosso, 1993). The capacity to achieve health goals depends on the organization and management of the district health system (Ministry of Health Republic of Rwanda, 2011).

The district Medical Officer of Health plays a crucial role in carrying out public health responsibilities which include planning, implementing, monitoring health targets through surveillance and coordinating various programs and services. Plans developed with the local community's interest in mind whilst obtaining their support and active participation, together with collaboration within the various stakeholders and agencies will greatly improve health outcomes.

An important feature of good health service refers to delivering effective, efficient, safe and quality health interventions to those who need them, at a time and place when they need them, maximizing the benefits over cost (WHO, 2007). The district health system provides a comprehensive range of health care services which include primary, secondary and tertiary preventive care to a population that is geographically defined by the districts coverage. The implementation of services provided can be divided into several units which include Public Health Management, Support Services, Primary Care, Family Health, Disease Control, Occupational and Environmental Health, Food Quality and Health Education and Promotion Units. This is done through multiple service points which include primary health care at large, schools, and also mobile health clinics that cater to the remotest of areas. In recent years, the disease control unit, particularly the Non –Communicable Disease unit in the Ministry of Health Malaysia has had much focus as its country undergoes a major epidemiologic transition.

1.2 Non-communicable Disease

Non-communicable diseases (NCDs) are the leading causes of morbidity in the world and accounts for seven of ten worldwide deaths (Alleyne et al., 2013). In the year 2016, 71% of global death were due to NCDs amongst which one third of them were classified as premature deaths as they occurred in those aged 30-70 years. The mortality is highest in low and middle-income countries especially sub Saharan Africa and is at its least in high-income countries (Bennett et al., 2018). Poverty has been seen to stem from and exacerbate the burden of NCD's (Nugent et al., 2018) causing the burden to rise disproportionately.

In 2011, the WHO member states in the United Nations had given their commitment to reduce mortality (by 2025) from the four largest contributors of death attributed to NCD worldwide namely cardiovascular disease, cancer, diabetes and chronic respiratory disease among those

aged 30-70 years by 25%. This was in relation to the statistics of the previous year in a term they coined as the 25x25 target (Nugent et al., 2018).

The Sustainable Development Goal number 3.4 also echoes a similar target whereby its goal is to reduce by one third the premature mortality of NCD through prevention and treatment and promoting mental health and wellbeing by 2030. Comprehensive indicators have been set up to help achieve these goals, for example indicator 23 under goal 3.4 measures the probability of dying between exact ages of 30-70 years from either of the four diseases mentioned. The disaggregation is done by sex and geographical location targeting healthcare systems. It also monitors mental health with suicide mortality being the indicator. Consultations with primary healthcare providers that include preventive and curative services are also being monitored under indicator 26 giving the district health office a major role to play in realizing these goals.

1.2.1 Malaysia Situation

The situation of NCD in Malaysia has been likened to that of an epidemic, requiring urgent attention given that Malaysia has the highest prevalence of diabetes and obesity among all ASEAN countries (WHO, 2014). In line with reducing the financial burden of NCD both for the patient and healthcare, the district health office plays a vital role in disease prevention through health promotion and disease prevention programs that often address social determinants of health. These determinants influence modifiable risk behaviours that contribute towards chronic diseases.

1.2.2 Risk Factors

The rise in NCD falls back to four major risk factors namely tobacco use, harmful use of alcohol, unhealthy diets and physical inactivity that leads to four key changes within the person which are raised cholesterol, raised blood glucose, raised blood pressure, and overweight/obesity (*Global Health Observatory (GHO) data*, n.d.). Risk factor surveys have been included as one of the non-communicable disease progress monitoring measures providing surveillance into this area as well (World Health Organization (WHO), 2015). Tackling these risk factors through various prevention programs paves the road to successfully preventing or reducing the four NCD's.

Malaysia has placed great importance to the control of tobacco and has achieved two out the five SDG indicators with regards to tobacco demand-reduction measures (World Health Organization (WHO), 2015). Continuous efforts are being made to create smoke free policies by eliminating exposure to second hand tobacco smoke in all indoor workplaces, public places and public transport. This can be seen by the recent proposed smoking ban on all public eateries (Fatimah, Z. (2019, January 1). The district health office through the responsibilities of the health inspectors carry out the task of enforcing these smoking bans. Restrictions and bans in relation to alcohol usage including reducing hours of sales, increased taxes on alcoholic beverages and mitigating exposure to alcohol advertisements are among the measures that needs to be achieved in reducing this risk factor.

Nutrition-related chronic diseases can be prevented by recognizing the essential role that diet and physical activity play in determining good nutrition and optimal health. This risk factor is

largely affected by intrinsic and extrinsic factors adopting the socio-economic model, hence programs targeting the individual and the community at large whilst providing suitable environments that enhance healthy choices is most needed (U.S. Department of Health and Human Services, 2015). The districts play a part in empowering the people to create healthy environments leading them to take responsibility and be a part of the global reduction of non-communicable disease. This can be achieved through creating a healthy and positive relationship between the community and the health care providers in the district (WHO Technical Report Series, 2002).

1.3 District Health and Prevention

The prevention of non-communicable disease at the district level requires adequate planning preceded by situation analysis whereby the current situation and needs of the community is gathered and various inputs combined to come out with appropriate action plans. This is followed by implementation of services and programs tailored at preventing NCDs and continuous monitoring followed by prompt evaluation. Although the District Health Office in Malaysia sits at the bottom level under the hierarchical organization carrying out the many larger plan of actions provided by the Ministry of health, nevertheless, it plays a pivotal role in implementing preventive measures as it has the capacity to build relationships with the community thus enabling them to make healthy decisions for themselves and their families. This article aims to outline the Public Health Management of non-communicable disease at the district level in Malaysia.

2.0 Materials and Methods

A literature review was conducted through online database search such as Google Scholar and PubMed to identify articles that were related to the current management of NCD prevention. Initial keywords used were “district health management”, “non-communicable disease”, “prevention” and “Malaysia”. The reference list was also reviewed for other related articles including some that were handpicked. Information and statistics used in the write up of this report was identified and reviewed through related government documents on district health management and clinical practice guidelines on NCD prevention through Ministry of Health Malaysia websites and organization reports such as the WHO and United Nations (UN).

3.0 Result and Discussion

In this section, the management of non-communicable disease prevention will be explained through an insight into the plans made to prevent NCD, while focusing on the implementation of actions through primary, secondary and tertiary prevention levels that fall within the role of health professionals and health care providers in primary care, hospitals and community services environment. Current programs and practices in Malaysian districts will be used as an example in the explanation followed by steps taken to monitor and evaluate these programs.

3.1 Planning of NCD Prevention at District Level

Planning aims to improve and maintain the health status of a given community through the provision of accessible, effective, equitable and quality health service. In Malaysia, health care system is performed as a top down exercise whereby most of the national planning is conducted by the Ministry of Health. However, at the ground level, the district health office needs to conduct situational analysis to identify the needs and challenges of the local community within their jurisdiction. Analyzing the data collected helps in prioritizing issues, create plans of actions and set up performance indicators (Healy, 2013). The vision, mission and strategies of the district NCD division will echo that of the national level with minor tweaks to suite the local community.

The 11th Malaysia plan on NCD focuses its attention on preventive healthcare and promotion of healthy lifestyle in collaboration with the private sector and NGOs. Reducing modifiable risk factors and strengthening health systems are among the objectives laid out in the National Strategic Plan for Non-Communicable Disease 2016-2025 (Ministry of Health, 2016).

3.2 Implementation of NCD Prevention at District Level

3.2.1 Primary Prevention

Primary prevention defines the action taken prior to the onset of disease, whereby it removes the possibility that the disease will ever occur (Katz & Ali, 2009). The intervention targets the pathogenesis stage of the disease and is accomplished by measure of “health promotion and specific protection”. Health promotion involves health education, environmental modifications, nutritional interventions, and behavioural changes. On the other hand, specific protection can be accomplished by immunization, chemoprophylaxis, use of specific nutrient or supplementations. The main goal is to induce a change in behaviour or to alter the factors affecting individuals in order to prevent the development of the diseases. Primary prevention may be directed at individuals or at communities as a whole. Individual approaches such as encouraging patients to involve themselves in tailored physical activity provides active personal communication which should be motivational. On the other hand, a community or population approach is done through campaigns and programs having effects of changing risk factors in the whole population (Katz & Ali, 2009).

The strategies used for primary prevention at district level are not limited but include community empowerment and health education to the target population.

3.2.1.1 Community Empowerment

Community empowerment refers to the process of enabling communities to increase control over the factors and decision that influence their lives. In Malaysia, community empowerment is done through various community-based health programs such as the “Healthy Community Empowers the Nation” program, also known as KOSPEN that aims to combat and reduce the burden of NCD at grassroots level. The program was launched in 2014 by the Ministry of Health in collaboration with the Community Development Department (KEMAS) for rural areas, in collaboration with the Department of National Unity and Integration for urban areas. At the district level, KOSPEN is implemented by the District Health Office and District

Community Development Department empowering the community in adopting and practicing healthy lifestyles whilst enhancing their participation and involvement in such activities. Focusing on five scopes which are healthy diet, active living, smoke free, weight management and routine community NCD risk factor screening, the health personnel from the District Health Office and health clinics are responsible to train a group of volunteers among the community members on the implementation of KOSPEN, who will then become health agents of change in the community (MOH, 2013).

Besides KOSPEN, the Community Health Promotion Centre (PPKK) also aims to empower the communities bound by the district. District health office staff conduct practical activities in order to increase the knowledge, provide skills and change the lifestyle of the community indirectly complimenting the services provided by the health clinics under the district. The target group is the local community focusing on teenagers, housewives as well as senior citizens emphasizing on healthy lifestyle through physical activities, healthy eating, non-smoking initiatives and measures in coping with stress. The surrounding community are able to enjoy the facilities of the centre such as mini gymnasium under supervision of certified trainers, and health information resource centre or mini library without payment. They also have access to other services allocated at the centre which include the health screening, weight management interventions, service advisor in smoking cessation, healthy food and stress management. The centres also runs specific physical activity programs periodically to encourage the community in the district to have a healthy lifestyle such as 10,000 steps walk, cycling, hiking and aerobics (MOH, 2017).

Community empowerment is a weapon to combat nicotine addiction. At the district level, smokers who are ready to stop smoking are assisted through the quit smoking clinic which is provided in most health clinics. Counselling, and pharmacological assistance is given by the district health staff which consists of doctors, nurses and pharmacists. With the introduction of mQuit Services, the private sector also plays an important role in combating nicotine addiction by collaborating to provide quit smoking services to the district community.

3.2.1.2 Health Education

The district plays a pivotal role in giving health education to the community as it is through the activities of the district that most health information is disseminated. Among the essential platforms available to disseminate knowledge regarding health is through the school health program which is delivered by a team of medical doctors and nurses.

In 2000, the Ministry of Health also launched the Junior Doctor Program in collaboration with the Ministry of Education, where later in 2006 it became one of the co-curriculum activities in school known as “Junior Doctor Club”. The objectives include forming healthy habits among the school children by increasing knowledge and basic skills of health, encouraging parents on children’s health and strengthening teacher’s involvement in school children’s health (MOH, 2017). The health promotion officer of the district together with medical officers goes down to each school where they become facilitators to the teachers and selected school children from year 4, 5 and 6. The teachers and students are trained and provided with knowledge and skills on health and later become an agent of change on knowledge, behaviour and habits related to health for themselves, friends, parents and the community. Among the topics highlighted are self-hygiene practices, dental health practice, healthy mind, safe and

healthy food, healthy life style, preparedness for adolescence and moral values and practices (MOH, 2012).

Another activity in imparting health education at the district level is the Healthy Community Kitchen program which aims to educate the community about healthy and nutritious diet. It is usually carried out by nurses at the health clinics. The target group is the community members, for example housewives, or other family members of all age groups. The activities conducted are demonstration on healthy cooking recipes, techniques of food processing and prevention of accidents in the kitchen. The participants are also briefed on nutrition, safe food and kitchen management. Alongside this, health personnel take the opportunity to conduct related health screenings such as body mass index (BMI), blood pressure and blood sugar measurement (MOH, 2014).

Besides on-going programs as mentioned above, health promotion campaigns and health education camps are organised periodically by the district health office to instil knowledge regarding health and enhance active communication between the district and the community.

3.2.2 Secondary Prevention

Secondary prevention is defined as an action which halts the progress of disease at its incipient stage and prevents complications (Katz & Ali, 2009). Specific interventions include early diagnosis through screening programs, and adequate treatment so that better prognosis may be obtained. At the district level, various screening programs are planned for the community which includes screening for diabetes mellitus, cancer, cardiovascular disease and chronic respiratory disorder.

3.2.2.1 Diabetes Mellitus

Type 2 Diabetes Mellitus (T2DM) is an important risk factor for cardiovascular disease. Although incurable, it can be controlled with medication, change of diet and increase in the physical activity (MOH, 2015). The family health physicians, medical officers, pharmacists, nurses and medical assistants give great importance and play an important role in screening and treating diabetic patients at the health clinic. Screening is done via random capillary blood glucose, fasting blood sugar, oral glucose tolerance test (OGTT), and also MGTT for indicated pregnant women. Strategies to allocate human resource and finance for this huge program lies in the competency the leader which is the district health officer.

3.2.2.2 Cancer

Malaysia is committed to shifting its focus on the control of cancer and non-communicable diseases from reactive to proactive looking into investment in public and preventive health to reduce risk factors ("Malaysia wants to be proactive," 2018). At the district level, secondary prevention involves screening for the many types of cancers and its risk factors namely colorectal, cervical and breast cancer.

In its efforts to mitigate the prevalence of colon cancer, the district through its primary care facilities conduct screening methods such as faecal occult blood test (FOBT's) for men and woman aged 50-75 who are asymptomatic. In the event of the patients having any symptoms they would be referred to the hospital for colonoscopy (Kamaruzaman, 2018). The district

health office constantly advocates for collaboration with other agencies such as The Cancer Advocacy Society of Malaysia in organizing colorectal screening workshops (“Free colorectal cancer screening,” 2018). This screening method can effectively reduce the financial burden associated with treatment of colon cancer as well as reduce the morbidity and mortality associated with it.

Breast cancer is the most common cancer among Malaysian females (Azizah Ab M, Nor Saleha I.T, Noor Hashimah A, Asmah Z.A, 2016). The current screening policy for breast cancer focuses on Clinical Breast Examination whereby all women above the age of 20 must undergo breast examination by trained health care providers once in 3 years and annually for age 40 and above (Dahlui, Ramli, & Bulgiba, 2011). These services are provided by the district health service through their many healthcare professionals in the health clinics. Engagement with other ministries such as the Ministry of Women, Family and Community Development who provide subsidies for women to undergo mammogram has seen to reap benefits.

Cervical cancer screening by means of pap smear is done at the government health clinics. However, response has been poor with less than 50 per cent of women coming for check-ups for various reasons (Ministry of Health, 2017). Newer methods of screening are being researched and tried out at district levels such as the ROSE project. It is an initiative by the University of Malaya and the Ministry of Health in collaboration with VCF foundation Australia (“Malaysia well below WHO standards,” 2019). It integrates the latest advances in self-sampling by empowering women to take their own cervical screening sample while using digital health platforms to inform the results on the same day. Constant engagement with the community to find out their needs and concerns added with adequate research leads to the district being able to provide better services to those under their care.

3.2.2.3 Cardiovascular Disease

The most widely utilized screening at the primary care facilities are the cardiovascular screening which is done annually for all Malaysians aged 40 and above. This includes routine blood tests, electrocardiogram, urine analysis, blood pressure monitoring and anthropometric measurements and aid in the early detection of cardiovascular disease amongst those at risk by age. Reducing blood pressure by 10–15/5–8 mmHg with drug treatment reduces combined CVD mortality and morbidity by about one-third (World Health Organization, 2007). The district health officer manages the health budget given to ensure provision of all these medications as improving treatment strategies has helped reduce NCD mortality.

3.2.2.4 Chronic Respiratory Disorder

Chronic respiratory disease is one of the four major NCD’s that is given priority in the latest WHO guide. It is a preventable and treatable respiratory disorder with tobacco smoking as its main risk factor. Symptoms of chronic obstructive pulmonary disease (COPD) depends largely on the stage and severity of the disease ranging from chronic cough with sputum, dyspnoea, fatigue and up to respiratory failure.

Health clinics under the jurisdiction of the district office gives importance to this by conducting screening not only for patients who are at high risk but also for all its staffs.

Besides history taking and physical examination by the doctor, chest x-ray and post bronchodilator spirometry test are conducted to screen for CPOD among individuals identified at risk. Besides that, other routine investigations such as full blood count (FBC) and electrocardiography (ECG) are also available. For employees working under the district, a spirometry test is conducted annually as well. Treatment consist of referral to smoking cessation clinic where applicable, usage of inhaled bronchodilators and other medication.

3.2.3 Tertiary Prevention

Tertiary prevention is defined as “all measure available to reduce or limit impairment and disabilities, and to promote the patients adjustment to irremediable conditions”(Katz & Ali, 2009). The tertiary prevention is accomplished by disability limitation, and rehabilitation. At the district level, these services are provided through follow up, domiciliary care, and supported by an efficient referral system.

3.2.3.1 Rehabilitation

Rehabilitation refers to appropriate measures, including peer support, to enable persons with disabilities to attain and maintain their maximum independence, full physical, mental, social and vocational ability, and full inclusion and participation in all aspects of life”(World Health Organization, 2011). The aim of rehabilitation is to minimize residual disabilities and complications, and maximize potential years of enjoyable life, thereby improving the quality of life even if the disease itself cannot be cured.

Rehabilitation care in district clinics include consultation services for assessment, therapeutic and rehabilitative care, nursing care, physiotherapy, occupational therapy, medical social services, and speech therapy. Rehabilitative services are provided to older people as a supportive service to medical care such as disabled post stroke patients or amputees. Most stroke survivors are discharged with instructions for follow-up care by primary care clinic. Referrals are usually received from secondary and tertiary hospitals for patients to receive appropriate care after the disability or complication has occurred, and after patient has been stabilized to regain the maximum strength they can achieve. In Malaysia, almost every district's clinics are covered with rehabilitation staff, including registered physiotherapist, occupational therapist, trained nurses, speech therapist and well-equipped rehabilitation clinics to serve patients. Besides the special consideration in access to medical care services such as priority in registration and appointments, patients are also provided with wheel chair services and in some circumstances the transportation.

3.2.3.2 Follow up care

Follow up care for patients after diagnosis is done at the many primary health clinics throughout the district. This is essential to prevent further complications from pre-existing disease. For example, in diabetes, intensive glycaemic control can delay the onset and progression of the early stages of diabetic retinopathy, nephropathy and neuropathy in diabetic patients. Regular screening for micro-albuminuria, retinal photography, and foot examination are done. Most health clinics are equipped with fundus camera to assist in detection of retinopathy for detection and monitoring diabetic complication especially clinics

with Family Medicine Specialist. Diabetic patients are also being screened annually for urine albumin to detect early signs and managing renal complications among diabetic patients.

3.2.3.3 Domiciliary care

The "home help service" is offered to older persons under the name of Domiciliary Treatment Service (PPD) whereby its services include treatment services, monitoring of NCDs risk factors, such as blood glucose test, blood pressure measurement, and rehabilitation activities including the rehabilitation physiotherapy, occupational therapy, and counselling for stable cases that needs long-term care such as stroke patients and chronic disease patients who are functionally disabled. The domiciliary treatment service (PPD) is provided by well-trained teams from health clinics governed by the district, covering all residents living within the area of clinic. The cases are referred from tertiary, state referral centres and secondary/district hospitals to the health clinics that provide the services.

3.2.3.4 Referral system

The Primary Health Care Delivery Network has been supported with an organized system of referral into all levels of primary, secondary and tertiary care. The function of primary care in this network behaves like a filter to refer those patients that meet specific access criteria to the specialized services and facilitates. Criteria for accessing these services are restricted to patients with complicated problems. The specialized facilities in secondary and tertiary care provide services for patients with specific health conditions or more complex and multiple comorbidities.

District Health Office is the main control authority of the referral system at the operational level. The health clinics and hospitals have common policies and operating procedures to facilitate rapid and efficient management of referred cases. Community clinics are able to refer to health clinics or directly to the hospitals, according to established patient management protocols. This system has helped Malaysia achieve gains in health status which are comparable to that in countries with higher health expenditure (Mustapha, 2014).

For example, cases with failure of suboptimal glycaemic control with multiple therapy lines, as well as having multiple comorbidities and complications, are referred to endocrinologists for further consultation and optimization of care, or cases with diabetic retinopathy, cataract or glaucoma are referred to the Ophthalmologist for further management. In contrary, the opposite way of referral holds true when stabilized patients post stroke or cardiac arrest are referred back to primary health clinics for rehabilitation services and supportive care.

3.3 Monitoring of NCD Prevention Program at District Level

At the district level, monitoring of NCD prevention program is done by the respective District Health Office which is led by the Health District Officer. The monitoring is done through surveillance, key-performance index (KPI), quality assurance (QA) achievement, audit on NCD program via two methodologies i.e. web-based application and paper-based forms (MOH, 2010). In the web-based application, data from health education programs, health promotion and intervention programs, are collected via web-based application. The application enables up-to-date monitoring of number of programs and number of participants

in each program. More importantly, it empowers monitoring of KPI on the NCD programs, for example, the percentage of weight loss after six months intervention. Among the examples of web-based application are MySihat online evaluation system (MOVes-KOSPEN), National Diabetes Registry, and National Cancer Registry. Several variables related to the process indicators are collected via paper-based forms which includes the expenditure reports, number of local trainings conducted and several other related information (MOH, 2010). All data collected at the district level will be sent to the state level and subsequently to the Ministry of Health, Malaysia.

4.0 Conclusion

The district health office and health clinics play an important role in execution of the national policy on non-communicable disease (NCD) at the district level. The management of NCD at district level includes comprehensive planning on specific goals, objectives and strategies based on community diagnosis of the district. Besides, they play an important role in organizing health related events that build social network among the health personnel and the community as well as implementing and monitoring the NCD programs. As a leader, the district health officer plays multiple roles including decision making on programs, human resource and finances while constantly motivating those under his care. With numerous strategies and programs laid out, collaboration and strengthened efforts from the district and community will certainly help prevent and reduce NCD in future.

Acknowledgement

We would like to thank the Director General of Health Malaysia for his permission to publish this article. Reference: KKM.NIHSEC.800-4/4/1 Jld.69 (60).

Declaration

Author(s) declare that there is no conflict of interest regarding publication of this article.

Ethics

This article has been approved by the Medical Research and Ethics Committee, Ministry of Health Malaysia (NMMR-19-782-47904)

Funding

This is a self-funding research article.

References

- Alleyne, G., Binagwaho, A., Haines, A., Jahan, S., Nugent, R., Rojhani, A., & Stuckler, D. (2013). Embedding non-communicable diseases in the post-2015 development agenda. *The Lancet*, 381(9866), 566–574. [https://doi.org/10.1016/S0140-6736\(12\)61806-6](https://doi.org/10.1016/S0140-6736(12)61806-6).
- Allotey, P. (2014). Addressing non-communicable diseases in Malaysia: An integrative process of systems and community. *BMC Public Health*, 14(SUPPL. 2), S4. <https://doi.org/10.1186/1471-2458-14-S2-S4>.
- Bennett, J. E., Stevens, G. A., Mathers, C. D., Bonita, R., Rehm, J., Kruk, M. E., ... Ezzati, M. (2018). NCD Countdown 2030: worldwide trends in non-communicable disease mortality and progress towards Sustainable Development Goal target 3.4. *The Lancet*, 392(10152), 1072–1088. [https://doi.org/10.1016/S0140-6736\(18\)31992-5](https://doi.org/10.1016/S0140-6736(18)31992-5).
- Chew, B. H., Shariff-Ghazali, S., Lee, P. Y., Cheong, A. T., Mastura, I., Haniff, J. ... Mustapha, F. I. (2013). Type 2 diabetes mellitus patient profiles, diseases control and complications at four public health facilities- A cross-sectional study based on the Adult Diabetes Control and Management (ADCM) registry 2009. *Medical Journal of Malaysia*, 68(5), 397–404. <https://doi.org/10.1088/0022-3727/32/3/005>.
- Dahlui, M., Ramli, S., & Bulgiba, A. M. (2011). Breast Cancer Prevention and Control Programs in Malaysia, (April 2015).
- Fatimah, Z. (2019, January 1). Smoking ban: After eateries, govt identifying launderettes and more. *The Star Online*, Retrieved from <https://www.thestar.com.my/news/nation/2019/01/01/smoking-ban-after-eateries-govt-identifying-launderettes-and-more/#Tpt3GZ2VY0Mho0Y3.99>
- Free colorectal cancer screening for eligible participants next week (2018, April 17), *The Star online*. Retrieved from <https://www.thestar.com.my/metro/metro-news/2018/04/17/free-colorectal-cancer-screening-for-eligible-participants-next-week/>
- Fusheini, A., & Eyles, J. (2016). Achieving universal health coverage in South Africa through a district health system approach: conflicting ideologies of health care provision. *BMC Health Services Research*, 16(1), 1–11. <https://doi.org/10.1186/s12913-016-1797-4>
- Global Health Observatory (GHO) data*. (n.d.).
- Healy, J. (2013). Ministry of Health, Malaysia Kamaliah Mohd Noh, Ministry of Health, Malaysia Khairiyah Abdul Muttalib, Ministry of Health, Malaysia Nour Hanah Othman, Ministry of Health, Malaysia Kalsom Maskon, Ministry of Health, Malaysia Abdul Rahim Abdullah, Ministry , 3(1). Retrieved from

http://apps.who.int/iris/bitstream/handle/10665/206911/9789290615842_eng.pdf;j

Institute for Public Health. (2011). NATIONAL HEALTH AND MORBIDITY SURVEY 2011, 4–5.

Institute for Public Health. (2015). *National Health and Morbidity Survey 2015 (NHMS 2015). Vol. II: Non-Communicable Diseases, Risk Factors & Other Health Problems. Ministry of health* (Vol. II). <https://doi.org/10.1017/CBO9781107415324.004>

Jabatan Perkhidmatan Awam (2003). Pekeliling PERkhidmtan Bil.3 Tahun 2003. Pemeriksaan Kesihatan Bagi Pegawai Perkhimatan Awam. Retrieved at <http://docs.jp.a.gov.my/docs/pekeliling/pp03/bil03/kesihatan.pdf>.

Kamaruzaman, H. (2018). *CPG Management of Colorectal Carcinoma*. Ministry of Health. Retrieved from https://www.researchgate.net/publication/325279510_CPG_Management_of_Colorectal_Carcinoma

Katz, D. L., & Ali, A. (2009). Preventive medicine, integrative medicine & the health of the public. *Summit on Integrative Medicine and the Health of the Public.*, 45.

Lembaga Promosi Kesihatan Malaysia. Manual Pengguna (Daerah). MySihat Online Evaluation Sytem (MoVes). Retrieved at <https://www.mysihat.gov.my/images/Manual%20Pengguna%20Daerah.pdf>.

Malaysia wants to be proactive in cancer control (2018, October 1), The Star online.

Retrieved from <https://www.thestar.com.my/news/nation/2018/10/01/malaysia-wants-to-be-proactive-in-cancer-control-says-dr-dzulkefly/>

Ministry of Health. (2016). *National Strategic Plan for Non-Communicable Disease NSP-NCD 2016-2025*. (D. F. I. Mustapha, Ed.), *Public Health Department Ministry of Health Malaysia*. Non-Communicable Disease (NCD) Section, Disease Control Division Ministry of health, Putrajaya. Retrieved from www.moh.gov.my

Ministry of Health. (2017). Clinical Practice Guidelines on Primary & Secondary Prevention of Cardiovascular Disease 2017. Ministry of Health Malaysia, 24. <https://doi.org/10.3109/01480548608998271>.

Ministry of Health. (2017). *NATIONAL STRATEGIC PLAN FOR CANCER CONTROL PROGRAMME*. Retrieved from [file:///C:/Users/ASUS/Downloads/National_Strategic_Plan_Book_final@25SEPT2017\(2\).pdf](file:///C:/Users/ASUS/Downloads/National_Strategic_Plan_Book_final@25SEPT2017(2).pdf)

Ministry of Health, Malaysia (2012). Bahagian Pendidikan Kesihatan. Modul Latihan Kelab Doktor Muda Sekoah Rendah Edisi Empat. Retrieved from <http://www.dr.muda.gov.my/kelab/old/GP/Downloads/modul4.pdf>

Ministry of Health, Malaysia (2014). Bahagian Pemakanan. Healthy Community Kitchen (DSM). Retrieved from <http://nutrition.moh.gov.my/en/dapur-sihat-masyarakat/>

- Ministry of Health, Malaysia (2015). Clinical Practice Guidelines Management of Type 2 Diabetes Mellitus 5th Edition
- Ministry of Health, Malaysia (2017). Bahagian Pendidikan Kesihatan. <http://www.infosihat.gov.my/index.php/projek-khas/pusat-promosi-kesihatan-komuniti>, <http://www.infosihat.gov.my/index.php/projek-khas/kelab-doktor-muda>.
- Ministry of Health, Malaysia. Bahagian Pendidikan Kesihatan. Garis Panduan Pelaksanaan, KOSPEN. Retrieved at <http://www.myhealth.gov.my/komuniti-sihat-perkasa-negara-kospen/> Ministry of Health, Malaysia. Clinical Practice Guideline (CPG). Management of Type 2 Diabetes Mellitus 5th Edition.
- Ministry of Health, Malaysia. Non-communicable Disease Section. Disease Control Division. Annual Report 2010. Retrieved at <http://www.moh.gov.my/images/gallery/nspncd/AnnualReport2010NCD.pdf>.
- Ministry of Health Republic of Rwanda. (2011). *Ministry of Health 2011 District-Health-System-Guidelines.pdf*. Retrieved from <http://www.moh.gov.rw/fileadmin/templates/Docs/District-Health-System-Guidelines1.pdf>
- Monekosso, G. L. (1993). A health district as the operational unit for primary health care. *Tropical Doctor*, 23(1), 7–8. <https://doi.org/10.1177/004947559302300105>
- Mustapha, F. I., Omar, Z. A., Mihat, O., Md Noh, K., Hassan, N., Abu Bakar, R., ... Nugent, R., Bertram, M. Y., Jan, S., Niessen, L. W., Sassi, F., Jamison, D. T., ... Beaglehole, R. (2018). Investing in non-communicable disease prevention and management to advance the Sustainable Development Goals. *The Lancet*, 391(10134), 2029–2035. [https://doi.org/10.1016/S0140-6736\(18\)30667-6](https://doi.org/10.1016/S0140-6736(18)30667-6).
- Nor Ain, R. (2019, January 14). Malaysia well below WHO standards for cervical screening. *New Straits Time*, Retrieved from <https://www.nst.com.my/news/nation/2019/01/450361/wan-azizah-malaysia-well-below-who-standards-cervical-screening>
- Nugent, R., Bertram, M. Y., Jan, S., Niessen, L. W., Sassi, F., Jamison, D. T., ... Beaglehole, R. (2018). Investing in non-communicable disease prevention and management to advance the Sustainable Development Goals. *The Lancet*, 391(10134), 2029–2035. [https://doi.org/10.1016/S0140-6736\(18\)30667-6](https://doi.org/10.1016/S0140-6736(18)30667-6)
- U.S. Department of Health and Human Services and U.S. Department of Agriculture. *2015 – 2020 Dietary Guidelines for Americans*. 8th Edition. December 2015. Available at <https://health.gov/dietaryguidelines/2015/guidelines/>.
- WHO. (2007). Everybody business : strengthening health systems to improve health outcomes : WHO's framework for action. Retrieved from https://www.who.int/healthsystems/strategy/everybodys_business.pdf
- WHO. (2014). *Global Status Reprt on Non-Communicable Disease. Global Status Report on*

Non-communicable diseases.

WHO Technical Report Series, N. 916 (TRS 916). (2002). *Diet, nutrition and the prevention of chronic diseases Report of the joint WHO/FAO expert consultation*. Retrieved from <https://www.who.int/dietphysicalactivity/publications/trs916/summary/en/>

World Health Organization. (2007). *Prevention of Cardiovascular Disease*. Retrieved from https://www.who.int/cardiovascular_diseases/guidelines/Full text.pdf

World Health Organization. (2011). World report on disability.

World Health Organization (WHO). (2015). *PROGRESS MONITOR 2015*. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/184688/9789241509459_eng.pdf?sequence=1

Yiengprugsawan, V., Healy, J., Kendig, H., Neelamegam, M., Karunapema, P., & Kasemsup, V. (2017). Reorienting Health Services to People with Chronic Health Conditions: Diabetes and Stroke Services in Malaysia, Sri Lanka and Thailand. *Health Systems & Reform*, 3(3), 171–181. <https://doi.org/10.1080/23288604.2017.1356428>.